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This print shows the Specification as it became open to public inspection.

## PATENT SPECIFICATION



Convention Date (France) : Mar. 26, 1920.

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Application Date (in United Kingdom) : Mar. 18, 1921. No. 8533 / 21.

Complete not Accepted.

### COMPLETE SPECIFICATION.

#### Improved Process for the Recovery of Rubber.

We, ODILON RODOLPHE BOUVERY, of Villa Saint-Georges, Allee des Muriers prolongee, Algiers, and FERNAND PAUL CONORT, of 19, rue de l'Orangerie, Algiers, both citizens of the French Republic, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The object of the process is to recover, devulcanise and replastify used or unused vulcanised caoutchouc, all forms of waste therefrom and the gums therein contained. A consequent object is to enable the same to be used over again, industrially, with a view to the production of any crude or manufactured articles or crude products whatsoever, without any restriction.

The process also applies to new natural or imitation rubber, as well as to gutta-percha and its natural or imitation substitutes.

The products to be regenerated are ground and reduced to powder by means of a mill of any suitable type. The degree of fineness of the powder is unimportant. The products to be regenerated may be ground along with the loading ingredients they contain, whether mineral or organic, or may be freed therefrom beforehand. They may even be ground along with the substances that have been incorporated with them in the case of manufactured articles, such as the fabric and beadings in the outer covers of motor tyres; fabric and threads in piping, old shoes, etc.

The impurities in new natural or imitation rubbers and in gutta-percha may be allowed to remain.

The powder obtained by grinding is placed, in quantities of any weight, in a

[Price 1/-]

vessel and moistened with about ten *per cent.*, by weight, of water containing glycerine equivalent to two *per cent.* of the weight of the products to be regenerated. An amount of paraffin equal to that of the glycerine is added, either in the form of powder or small fragments.

The whole is heated over direct fire on an ordinary grate. The water evaporates, the reaction sets in, the caoutchouc becomes devulcanised and the gums become replastified and re-polymerised—vulcanisation having de-polymerised them—and they recover their original properties under the treatment.

When vulcanised rubber has been treated, the resulting product is gummy, homogeneous and unites with itself readily. It has all the properties of new natural or imitation or artificial rubber, and furnishes the entire series of articles manufactured from caoutchouc pliable, semi-hard, hard caoutchouc and ebonites. It may form part of any mixtures employed in the rubber industry, and may replace new natural or imitation rubber for all applications and uses thereof.

When new rubber is treated the result of the treatment is to convert the treated gums into a new gum, a polymeric product of these latter, which in all cases exhibits the same new and valuable properties, great plasticity and high dielectric power. In the majority of cases, the commercial and industrial value of the rubbers treated is improved, apart from the industrial advantage resulting from the use of a rubber of invariable quality.

Whether vulcanised caoutchouc or new natural or imitation rubber be treated, the result is always the same, namely, the unification of the gums by the special

polymerisation brought about by the treatment; unification of the resulting rubbers or caoutchouc whatever their original condition or origin; and their transformation into an invariable product of great plasticity and high dielectric power.

The resulting product has no equivalent among the natural rubbers, and is almost a synthetic product. Its plasticity enables it to absorb considerable quantities of loading ingredients—far more than can be taken up by any natural caoutchouc or gum—and its dielectric properties enable it to be used as a substitute for gutta-percha in all the uses and applications of this latter, especially in the electrical arts; wires, cables, &c.

The product obtained in all cases revulcanises by mere addition of the necessary sulphur. It revulcanises more quickly, and is far more sensitive to variations in temperature during vulcanisation, than natural caoutchouc or gums.

The operations, mixing especially, required to fit it for industrial use, are shorter, less troublesome and require much less motive power than the working and mixing needed by the natural gums.

These properties, combined with the ready absorption of loading ingredients, make it valuable to rubber manufacturers, and more especially to those who make all kinds of ebonite. It is highly suitable and economical for this purpose and forms a serious improvement in this latter manufacture. Vulcanised to a semi-hard

condition, it furnishes an artificial leather, having all the properties and applications of real leather.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. Process for the recovery and devulcanisation of vulcanised or unvulcanised, used or unused caoutchouc of all forms, waste, gutta-percha, gums, resinous rubber, &c., characterised in that the products to be regenerated are ground and subjected to the action of heat with a mixture containing a minimum quantity of water, an amount of glycerine equivalent to about two *per cent.* of the weight of the products to be regenerated, and an equal proportion of paraffin in powder or fragments.

2. The utilisation of the product recovered by the process claimed in 1, by substitution for natural rubber in all its applications, especially in the manufacture of ebonites and of compositions on a basis of wood, cork, asbestos, powdered glass, corundum, emery, silica, *etc.*, said compositions containing very large amounts of loading ingredients.

Dated this 18th day of March, 1921.

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